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ABSTRACT

An electroplating bath, a system, a process for, and the article obtained from, depositing a zinc-nickel ternary or higher alloy, a) zinc ions; b) nickel ions; and c) one or more ionic species selected from ions of Te⁺⁴, Bi⁺³ and Sb⁺³, and in some embodiments, further including one or more additional ionic species selected from ions of Bi⁺³, Sb⁺³, Ag⁺¹, Cd⁺², Co⁺², Cr⁺³, Cu⁺², Fe⁺², In⁺³, Mn⁺², Mo⁺⁶, P⁺³, Sn⁺² and W⁺⁶. In some embodiments, the system includes a divider forming a cathodic chamber and an anodic chamber, with the electroplating bath in the cathodic chamber only. In various embodiments, the zinc-nickel ternary and higher alloys may provide improved properties to the conductive substrates upon which the alloys are deposited.

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